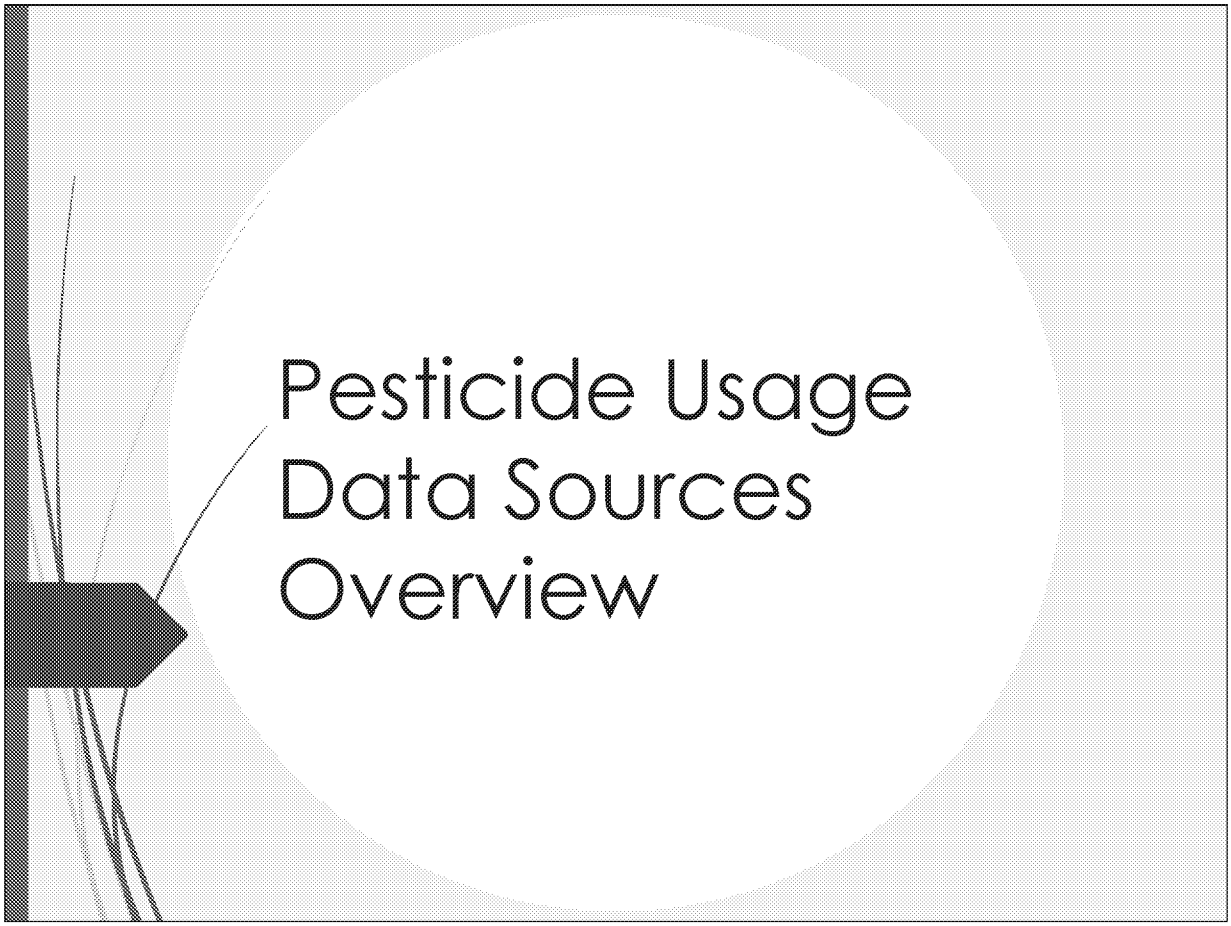
Pesticide Usage
Data Sources
Overview

The Importance of Pesticide Usage Statistics

- Provides information to assess risks and benefits
- Supports decision making about chemical registration
- Presents estimated pesticide use levels in agricultural and non agricultural practices
- Characterizes use and focuses on changes in use patterns over time
- Guards against overestimating risk

Primary Sources for National Level Pesticide Usage Data

- Agricultural
  - USDA NASS
  - CADPR
    - almost all of the country's almonds, apricots, dates, figs, kiwi fruit, nectarines, olives, pistachios, prunes, and walnuts are produced in California
  - Kynetec (proprietary)
- Non-agricultural
  - CADPR
  - Kline (proprietary)

Quality Requirements

- Documented quality assurance procedures
  - Statistical methodologies
  - Sampling plan (survey design)
- USDA NASS
  - https://www.nass.usda.gov/Publications/Methodology_and_Data_Quality/index.php
- CADPR
  - www.cdpr.ca.gov/docs/pur/purmain.htm
- Proprietary Sources (Kynetec, Kline)
  - Quality Management Plans
  - Statement of Data Quality

Assessing Quality of Survey Data

- Fitness for Use Evaluation
  - Does the quality as defined by the data producers and understood by the data user support the decisions to be made?
    - ***Credibility***
    - ***Comparability***
    - ***Relevance***
    - ***Completeness***

DATA USE	NASS	CADPR	Kynetec	Kline
Benefits Assessments	✓	✓	✓	✓
Percent Crop Treated	✓		✓	
Screening Level Usage Analysis (SLUA)	✓	✓	✓	
SIAB Use and Usage Matrix (SUUM)	✓	✓	✓	✓
Percent Crop Treated for New Uses	✓		✓	
Refined usage data request	✓	✓	✓	✓
Pesticide Industry Sales and Usage Report	✓	✓	✓	✓

PUBLIC DATA SOURCES

USDA NASS (National Agricultural Statistics Service)

Environmental surveys
- Program/data based
- Limited number of crops
- Multi-year survey cycle for a given crop

In addition to EPA, information is used by:
- Other Federal Agencies
- Academia
- Industry
- Farming/Grower Community

NASS Data Characteristics

Data items published include:

AGRICULTURAL CHEMICAL USAGE REPORTS 1990 -2016				
National Level (Multi-Program States*) Program State Level				
NASS DATA	Vegetables	Fruit	Field Crops**	Nursery & Floriculture
	Published intermittently	*Published intermittently*	*Published annually*	*Published intermittently*
Lbs AI Applied	√	√	√	√
No. of applications	√	√	√	
Rates per application	√	√	√	√
Rates per year	√	√	√	
Percentage of acreage treated	√	√	√	

*Program States – Selected states with at least 80% cover of target commodity acreage.
**Field crops (corn, cotton, potatoes, barley, soybeans, wheat, peanuts, etc.)

Other NASS Data Characteristics

Data items published include:

- Classification of active ingredients as herbicides, fungicides, insecticides, or other (regulators, desiccants, etc.)
  - *Rates and amounts applied are published in the acid or metallic equivalent, as applicable.*
- Notations on withheld data to avoid disclosure of farms(D), unavailable data (NA), and less than half of rounding unit (Z)

BENEFITS of Using NASS Data

- Crops only surveyed by NASS on the national level
  - *blueberries, eggplant, honeydew, oats, and specific caneberries (blackberries and raspberries)*
- Provides data on crops grown for processing as well as fresh markets
- Provides rates per application and rates per crop year
- Provides chemical distribution rates and includes the following:
  - median, mean, 90th percentiles
  - Coefficient of variation (CV)
- Helps to validate data from other sources

Limitations

- NASS does not report:
  - Usage data for crops on a yearly basis

Year of Data	NASS Publications			
	Vegetables	Fruit	Field Crop	Nursery & Floriculture
2006	√	-	√ (rice, soybeans, wheat)	√
2007	-	√ (apples only)	√ (cotton)	-
2008	-	-	-	-
2009	-	√	√ (wheat, wheat postharvest)	√
2010	√	-	√ (corn, cotton, potatoes)	-
2011	-	√	√ (barley, sorghum)	-
2012	-	-	√ (soybeans, wheat)	-
2013	-	-	√ (peanuts, rice)	-
2014	√	-	√ (corn, potatoes)	-
2015	-	√	√ (cotton, oats, soybeans, wheat)	-
2016	√	-	-	-

Other Limitations

- NASS does not report:
  - Pest data
  - Total Acres Treated
  - Sample sizes
  - Recent postharvest data (last report is 2007)
  - Usage data for nut crops.
  - Seed treatment data
  - Non-agricultural usage data

PUBLIC DATA SOURCES

CADPR– Pesticide Use Reporting Program

CADPR receives monthly reports from county ag commissioners who require growers to report their use of pesticides.

In addition to EPA, information is used by:

* Other Federal Agencies
* Industry
* Grower Groups
* Chemical Manufacturers

CADPR Data Characteristics

Data items published include:

Cal DPR Pesticide Use Reporting (PUR) Annual Reports 1991-2015					
PUR Data	Fruits	Vegetables	Field Crops*	Postharvest	Other**
Lbs AI Applied	√	√	√	√	√
Base Acres Treated	√	√	√		√
% of BAT (PCT)	√	√	√		√
Cumulative Acres Treated (TAT)	√	√	√		√
No. of applications	√	√	√		√
Rates of application (min., median, max)	√	√	√		√
Amount Treated (tons, etc.)				√	
* Field crops (corn, cotton, potatoes, barley, soybeans, wheat, peanuts, etc.)					
** Other sites (parks, golf courses, cemeteries, rangeland, pastures, and along roadsides and railroad rights-of-way, etc.)					

BENEFITS of Using CADPR Data

- The full use reporting program results in realistic and comprehensive pesticide use data
- Helps to validate data from other sources

Year	Buprofezin Use on Almonds (Lbs A.I. Applied)	
	Market Research Data	Cal DPR Data
2011	0	3,046
2012	198	9,160
2013	0	7,489
2014	1,919	24,090
2015	2,609	5,329
Average	945	9,823

BENEFITS of Using CADPR Data

- In the absence of data from other sources, helps to show relevance of chemical use.

Chemical	Pounds A.I. Applied				
	2011	2012	2013	2014	2015
Limonene	62,925	74,369	61,277	346,138	72,642

Limitations

- CADPR does not report:
  - Pest data
  - Homeowner use information
  - Industrial or institutional use information
  - Seed treatment data
  - Pesticide type (i.e. herbicides, insecticides, fungicides, etc.) in chemical summaries or data queries

PROPRIETARY DATA SOURCES

AMRD – Kynetec/iMap (formerly GfK)

Kynetec collects usage information annually directly from growers, who are paid to participate on a confidential basis. Kynetec then aggregates and sells this data

In addition to EPA, information is used by:

- Commodity Groups and Chemical Manufacturers
- USGS
- NGOs
- Universities/Agronomists
- Other Gov't Groups

Kynetec Data Characteristics

About the Survey:

- Updated yearly (in the spring)
  - Digital dataset 1998-2015
- Targets ≥ 80 % of US production of surveyed crops
  - ≈ 60 ag crops.
  - 45 states surveyed for at least one crop.

Data axes items published include:

- Crop, Year, AI, State, App method, App timing, Pesticide type (fungicide, PGR, herbicide, insecticide, nematicides), Pest targeted, Soil/Foliar, Aerial/Ground, Who applied, Product brand name, Registrant name, tank mix info, and MANY more things we look at less
  - ability to create customized groupings!

Data measures items published include:

- AI volume, Avg rate (lb AI/A), Total Acres Treated, Base Acres Treated for row crops, Sample size!, and numerous financial figures we don't typically use

BENEFITS of Using Kynetec Data

- Kynetec is our most complete and adaptable data set
  - The "go to" for most of our work
- Provides:
  - Major crop usage
  - Major growing state usage
- *Huge* database in iMap.
  - Can be dynamically analyzed/aggregated
  - VS NASS and CDPR's static data elements
    - must be combined and manipulated in excel/access.
    - can be difficult because of how the data is reported.

Limitations of Kynetec Data

- Cost is significant
- Data are proprietary
  - Can't be shared/published without aggregating and masking
- Does not report:
  - Data on smaller market crops
  - Smaller market states aren't surveyed for all crops
  - **County level data isn't statistically significant**
    - Data are provided, but generally it should not be used
  - Survey of seed treatment ended in 2014
  - Sugar cane ending in XXX
  - Non-agricultural sites aren't surveyed

Ag Crops not Surveyed at the National Level

- Beets
- Cactus
- Cashew
- Cassava
- Collards
- Cranberries
- Endive
- Honey
- Hops
- Limes
- Maple syrup
- Mushroom
- Okra
- Onion, green
- Papaya
- Pineapple
- Plantain
- Radishes
- Rye
- Safflower
- Spices, other
- Sweet Potatoes
- Tomatillo
- Turnips

PROPRIETARY DATA SOURCES

NMRD – Kline & Company

Kline collects usage information at various intervals based on the study segment. Data is obtained from end users as well as industry/university/extension/government representatives and trade associations. Kline then aggregates and sells this data.

In addition to EPA, information is used by:

- Commodity Groups and Chemical Manufacturers
- USGS
- NGOs
- Universities
- Other Gov't Groups

NON-AGRICULTURAL DATA SOURCE
Kline Studies

Data items published include:

- Consumer Pesticides and Fertilizers
- Professional Turf and Ornamental Markets for Pesticides and Fertilizers
- Professional Pest Management Markets for Pesticides
- Pest Control in Food Handling
- Industrial Vegetation Management
- Mosquito Control Market
- Stored Grains Market
- Biopesticides
- Specialty Biocides

Kline

- The only source of national level non-agricultural data
- Studies are conducted based on market interest rather than a specific frequency
- Sampling frame influenced by market size and share information
- Combination of structured survey and unstructured expert interviews
- Variables include acres treated, pounds a.i. applied, sample size, sales data by a.i. and product

Limitations of Kline Data

- Regional market share data is not provided consistently across all studies (only IVM and T&O)
- Limited state level data**
  - Mosquito studies reported at the mosquito abatement districts (MADs)
- Limited transparency due to proprietary nature of data

Data Gaps

- Mosquito adulticide
- *Global Mosquito Control Markets 2012, 2016 - Kline*
- Managed forest -
- Pasture – *Kynetec?*
- Right-of-way
- *Limited information from CADPR*
- Developed and open-space developed
- Golf courses

Professional Turf and Ornamental Markets for Pesticides and Fertilizers USA 2010, 2012 (Kline)

- Nurseries
- Rangeland – kynetec?